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**PETITION TO PUT A PATENT APPLICATION BACK ON THE DOCKET  
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Mohsen Shahinpoor, Massoud Ahghar & Niculina Cristina Popa

Serial Number: 10/064,729  
Filed: August 9, 2002

Examiner: Sheeba Ahmed  
Confirmation No. 4238, Art Unit: 1773

Date mailed: August 15, 2005  
Date of this response: 10/13/2005

For: Novel electrically active ionic polymer metal composites and novel methods of manufacturing them

**PETITION TO UNABANDON and RESPONSE TO OFFICE ACTION**

ATTN: COMMISSIONER FOR PATENTS  
Art Unt 1773  
PO BOX 1450  
ALEXANDRIA, VA 22313-1450

**RECEIVED  
OIPE/IAP  
OCT 18 2005**

Sir:

This letter is in response to the office action dated August 15, 2005 which informed us that the application was abandoned in view of no timely response to the last office action mailed 12/08/2004. We contacted the examiner Sheeba Ahmed and informed her that we never received the last office action of 12/08/2004. Examiner instructed us to file a petition to put the application back on the docket and was able to fax us a copy of the 12/08/04 office action which actually was not from the examiner but from a legal instrument examiner instructing us to put all claims on a separate sheet and eliminate duplicate claims. Had we received such an easy correction instruction we would have responded in a timely manner. But we never did. Here we are petitioning and requesting the commissioner to please put the application back on the docket and unabandon our application 10/064,729. We have enclosed a check for \$250 to cover the fees as well as the corrected set of claims and remarks for the examiner.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: ATTN:

Commissioner for Patents, PO Box 1450,  
Alexandria, VA 22313-1450 on the \_\_\_\_ 13<sup>th</sup> day of  
\_\_\_\_ October \_\_\_\_, 2005.

*M. Shahinpoor*

Mohsen Shahinpoor, the lead inventor  
Date Signed: October 13, 2005

10/18/2005 LWQNDIH1 00000017 10064729

01 FC:2202  
02 FC:2201

150.00 OP  
100.00 OP



**PATENT APPLICATION**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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**RESPONSE TO OFFICE ACTION**

ATTN: COMMISSIONER FOR PATENTS  
Art Unit 1773  
PO BOX 1450  
ALEXANDRIA, VA 22313-1450

Sir:

This paper is in response to the office action dated December 12, 2004. Please  
amend the application, without prejudice, as follows:

I hereby certify that this correspondence  
is being deposited with the United  
States Postal Service as first class mail  
in an envelope addressed to: ATTN:  
Commissioner for Patents,  
PO Box 1450, Alexandria, VA 22313-1450  
on the \_\_13<sup>th</sup>\_\_ day of \_\_October\_\_, 2005.

Mohsen Shahinpoor, the lead inventor  
Date Signed: October 13, 2005

In the Claims:

Claims 3, 4 and 5 have been withdrawn based on examiners objection. Claim 8 has also been withdrawn based on examiners comments. Please amend claims 1, 2, 6 and 7 as depicted below:

#### Amended Claims

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1. **(CURRENTLY AMENDED)** Novel ionic polymer metal composites ~~manufactured by means of an innovative chemical depositing process, the process comprising the steps of~~ are claimed. The said composites are manufactured by means of an innovative chemical depositing process, the process comprising the steps of: first depositing none-noble metal salt cations inside a cationic ionic polymer molecular network followed by chemical reduction of the said none-noble metal salt cations to generate reduced none-noble metal particles deposited inside the polymeric molecular network and the outside surfaces of the polymeric material, like outside metallic electrodes, followed by a second electro or chemo deposition and plating of a noble metal inside and on surfaces of the said reduced none-noble metal particles in the said polymer molecular network to protect the first said none-noble metal particles from oxidation, corrosion and chemical degradation for prolonged sensing and actuation applications of the said novel ionic polymer metal composite material ~~which generates an electrical signal with mechanical deformation and undergoes mechanical deformation if an electric field is imposed on it.~~

2. **(CURRENTLY AMENDED)** The manufacturing processes for the ~~novel ionic polymer metal composite material of claim 1, further comprising the steps of:~~ first depositing none-noble metal salt cations inside a cationic polymer molecular network and the outside surfaces of the polymeric material, ~~like outside metallic electrodes,~~ followed by chemical reduction of the said none-noble metal salt cations to generate reduced none-noble metal particles deposited inside the polymeric network, followed by a second electro or chemo deposition and plating of a noble metal inside and on surface of the said reduced none-noble metal particles in the said polymer molecular network to protect the first said none-noble metal particles from oxidation, corrosion and chemical degradation for prolonged sensing and actuation applications of the said novel ionic polymer metal composite material ~~which generates an electrical signal with mechanical deformation and undergoes mechanical deformation if an electric field is imposed on it.~~

3. **(ORIGINAL, WITHDRAWN)** The manufacturing processes for the novel ionic polymer metal composite material of claim 1, as described in claims 1 and 2 further comprising the steps of: adding dispersing chemicals to the said chemical reduction process, wherein said addition of a dispersing agent prevents reduced

noble and none noble metal particles to coalesce and helps forming uniformly distributed none noble metal particles chemically deposited inside the ionic polymer network and further helps them to penetrate deeper into the said ionic polymer molecular network.

4. **(ORIGINAL, WITHDRAWN)** The manufacturing processes for the novel ionic polymer metal composite material of claim 1, as further described in claim 2 further comprising the steps of: adding an alcohol solvent to the reduction solution, wherein said addition of an alcohol solvent such as isopropyl alcohol and/or ethyl alcohol, helps expand the ionic polymer network and enhances deeper penetration of noble and none noble metal particles into said ionic polymer molecular network.

5. **(ORIGINAL, WITHDRAWN)** The manufacturing processes for the novel ionic polymer metal composite material of claim 1, as further described in claim 2 further comprising the steps of: mechanically stretching the said ionic polymer before the start of manufacturing processes described in claims 1, 2, 3 and 4, wherein said mechanical stretching helps expand the ionic polymer network and enhances deeper penetration of noble and none noble metal particles into said ionic polymer molecular network.

6. **(CURRENTLY AMENDED)** The sensing property of novel ionic polymer metal composite of claim 1 to be used in electromechanical sensors in the sense that if they are mechanically moved or deformed they generate an electrical voltage across their surface electrodes with an accompanying current. ~~Typical values are that for a cantilever sample of such active materials of dimensions 20 mmx5 mmx0.2 mm flipped at one end by 10 mm, generates up to 10 mV across its surface electrodes.~~

7. **(CURRENTLY AMENDED)** The novel ionic polymer metal composite of claim 1 ~~to be used as electromechanical actuators, transducers and artificial muscles in the sense that if they are electrically activated by placing~~ imposing an electric field across their surface electrodes ~~of the said~~ in a cantilever configuration ~~sample in claim 6 as a bending actuator, they move or bend or flip dynamically like a wing with time varying electric fields. Typical values are that a cantilever sample of such active materials of dimensions 20 mmx5 mmx0.2 mm placed in an electric field of 5 mV/cm, generates a bending deflection of about 10 mm at its free end.~~

8. **(ORIGINAL, WITHDRAWN)** The novel ionic polymer metal composite material of claim 1 further encapsulated inside a flexible polymeric membrane to keep it hermetically sealed and moist and to provide additional outside protection.

## REMARKS

In the office action of August 24, 2004, the examiner correctly objected to claims 1 and 2 as being of improper dependent forms. These claims have been amended to be independent in the sense that claim 1 claims the novel materials and claim 2 claims novel manufacturing method for the said novel materials. Claims 6 and 7 are also amended to further reflect the claims. It is now believed that the claims are in proper form to be allowed by the examiner and such consideration is greatly appreciated.

Respectfully Submitted



Mohsen Shahinpoor  
Lead inventor

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